METHOD AND SYSTEM FOR TRANSFERRING IMAGES FROM AN IMAGING SOURCE DEVICE TO A DESTINATION

CROSS REFERENCE TO RELATED APPLICATIONS

5   This application claims the benefit of U.S. Provisional Application No. 60/199,530, filed on April 25, 2000, and incorporated herein by reference.

TECHNICAL FIELD

This invention relates generally to processing, on a computer, images received

10   from an imaging source device and, more particularly, relates to transferring images from an imaging source device through a computer to any destination.

BACKGROUND OF THE INVENTION

The use of imaging source devices in conjunction with personal computers

15   has become increasingly popular and more affordable. Home users in particular have taken advantage of recent advances in imaging technology to organize their existing film-photo collections and to take new digital photos. A user may, for example, attach a scanner to his personal computer and scan in his old 35mm photographs. The scanned-in photographs may then be saved in digital form on the computer's hard

20   disk. The user may also take digital photographs with a digital camera, attach the camera to his computer, and transfer the digital images to the hard disk.

Once the digital images have been saved on the hard disk, the user can do as he wishes with them. He may, for example, send the images to an external destination, such as an attached printer, a CD-Write device, a web site, or an email

25   address. However, currently available imaging software requires the user to perform the above procedure in at least two separate steps. Specifically, the user has to open up one application to transfer the image from the imaging source device to the computer's hard drive, and then open another application to transfer the image to the destination. Likewise, the programmer who writes the imaging software must write

30   code for each of these steps. Thus, it can be seen that there is a need for a new

method and system for transferring images to from imaging source device to any destination that allows the user to accomplish the transfer in such a way that it appears to be a single step, and that provides a standardized programming interface to simplify the software development process.

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SUMMARY OF THE INVENTION

In accordance with this need, a method and system for transferring images from an imaging source device to a destination is provided herein. The invention includes a novel image helper program that transfers images from the imaging source

10   device to the destination with minimal intervention on the part of the user. The image helper program gives the user the impression that the images are being transferred from the imaging source device directly to the destination. In one implementation, the user is given the opportunity to select from several possible destinations.

According to one aspect of the invention, a customized program module or

15   "plug-in" is provided for each destination to which the helper program may send images. Once the destination has been determined, either automatically or as a result of the user's selection, the helper program locates the plug-in corresponding to the destination. The plug-in then takes control of the process, and performs such additional steps as querying the user for any additional information needed, and

20   transferring the images to the destination. The helper program provides a standardized programming interface that can be used by all plug-ins. Thus, if a software developer whishes to expand the capability of the image helper program by allowing it to access other destinations, he need only write code for a new plug-in using the programming interface of the helper program.

25   Additional features and advantages of the invention will be made apparent from the following detailed description of illustrative embodiments that proceeds with reference to the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

While the appended claims set forth the features of the present invention with particularity, the invention, together with its objects and advantages, may be best understood from the following detailed description taken in conjunction with the accompanying drawings of which:

FIGURE 1 is a block diagram generally illustrating an exemplary computer system on which the present invention resides;

FIG. 2 is a user interface from which a user can select an destination to which the image helper program is to send an image or images in an embodiment of the invention;

FIG. 3 is a user interface on which a user can enter additional information required by the image helper program in an embodiment of the invention;

FIG. 4 is an example of a progress indicator showing the progress of an image transfer in an embodiment of the invention.

FIG. 5 is an example of a destination that may be opened by the image helper program in an embodiment of the invention;

FIG. 6 is a block diagram of the software architecture used in an embodiment of the invention;

FIG. 7 is a block diagram of the software architecture of a MICROSOFT WINDOWS embodiment of the invention; and,

FIG. 8 shows a flow chart of a procedure used to transfer images in an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Turning now to the drawings, wherein like reference numerals refer to like elements, the invention is described hereinafter in the context of a computing environment. Although it is not required for practicing the invention, the invention is described as it is implemented by computer-executable instructions, such as program modules, that are executed by a computing device. Generally, program modules include routines, programs, objects, components, data structures and the like that

perform particular tasks or implement particular abstract data types. Certain types of modules have specialized functions. For example, modules that are designed to facilitate communication between a computing device and internal or external hardware are often referred to as "drivers." Program modules are typically stored on

5 computer-readable media. Computer-readable media includes, but is not limited to, Random Accessing Memory (RAM), Read-Only Memory (ROM), electrically erasable programmable read only (EEPROM), flash memory, CD-ROM Digital versatile disk (DVD), flash memory, magnetic tape, and magnetic disk.

Functions performed by a computing device are often organized into "layers."

10 Each layer performs a step or group of steps, and passes the results of the step or steps to the next layer via one or more programming interfaces. Layer are, themselves, made up of one or more programming modules.

The invention may be implemented in variety of computing environments. For example, the invention may be realized in personal computers (PCs), hand-held

15 devices, multi-processor systems, microprocessor-based programmable consumer electronics, network PCs, minicomputers, mainframe computers, computerized appliances, personal digital assistants (PDAs), cellular telephones and the like. The invention may also be practiced in distributed computing environments, where tasks are performed by remote processing devices that are linked through a

20 communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices. The term "computer" as used herein includes any of these computing environment.

Before describing the invention in detail, an example of a computing environment in which the invention operates will be described with reference to FIG.

25 1. The example computing environment includes a computing device or computer 100. In its most basic configuration, the computer 100 typically includes a processing unit 102 and memory 104. Depending on the exact configuration and type of the computer 100, the memory 104 may be volatile (such as RAM), non-volatile (such as ROM or flash memory) or some combination of the two. Additionally, the computer

30 100 may also have removable and/or non-removable computer-readable media.

Removable computer-readable media includes, but is not limited to, optical disks, magnetic "floppy" disks, or tape. Non-removable computer-readable media includes, but is not limited to, magnetic "hard" disks. It is understood the functions of the hard disk 108 may be performed by some other computer-readable media. The computer

5   100 may also have other input devices such as a keyboard, and/or output devices, such as a display 106. Other aspects of the computer 100 may include network connections to other devices, computers, networks, servers, etc. using either wired or wireless media.

To help illustrate the invention, the computer 100 is shown as communicating

10   with an imaging source device 110. An imaging source device is a device that can read, create or store images. There are many possible implementations for the device 110, including, but not limited to, a scanner, digital camera, or memory card reader. The term "image" as used herein includes the computer-readable data that makes up an image and may also include meta-data associated with the image. Data that makes

15   up an image may be stored as a single file or broken up its several files. Image data may also exist in the form of transmissible packets.

To further help illustrate the invention, the computer 100 is shown as communicating with a cloud 112, which represents destinations to which images obtained from the imaging source device 110 may be transferred. These destinations

20   may external to the computer 100 or may represent components that are housed within the computer, and include, but are not limited to, printers, CD-Write devices, web sites, and email recipients. All of the above-described devices are well known in the art and need not be discussed in any greater detail here.

The invention is generally directed to a method and system that allows a user

25   of a computer to transfer an image from an imaging source device through a computer to a destination in such a way as to give the user the impression that the image is being transferred directly from the imaging source device to the destination. In one embodiment, the invention is practiced on a user's home computer and allows the user to perform such tasks as uploading pictures from his digital camera to a personal

30   web site. In another embodiment, the invention is practiced on a computerized kiosk,

to which users may attach their digital cameras and have their pictures sent to a destination. For example, a family on vacation could locate the nearest kiosk and post their vacation photos to their family web site.

In accordance with an embodiment of the invention, an image helper program
5 executes either in response to the detection of the imaging source device 110 (FIG. 1) by ordinary plug and play technology, or in response to a user-initiated action, such as the user double-clicking an icon representing the device. Upon execution, the helper program displays a user interface (UI) on the display device 106. An example implementation of the UI is the "Wizard" UI 114 shown in FIG. 2. The UI 114
10 prompts the user to select the destination to which the image should be sent. The helper program then prompts the user for follow-up information, if required. For example, if the user chooses to send an image from the imaging source device to a MICROSOFT NETWORK (MSN) community, the helper program prompts the user with the UI 116, illustrated in FIG. 3, to elicit the name of the MSN community to
15 which the image is to be posted.

Once the helper program has finished prompting the user for additional information (if needed), the helper program transfers the image from the imaging source device 110 (FIG. 1) to the hard disk 108. During the transfer to the hard disk, the helper program may display a progress UI 118 (FIG. 4). Once the transfer of the
20 image to the hard disk is complete, the helper program launches the appropriate application for transferring the image from the hard disk to the destination chosen by the user. In this example, since the user chose to transfer the image to an MSN community, the helper program opens a browser to the correct web address and posts the image to the MSN community web site (FIG. 5). The transfer from the imaging
25 source device to an external destination – in this case the web site – is then complete.

According to another embodiment, the image helper program does not transfer the image to the hard disk 108, but instead transfers it directly to the destination. This embodiment allows for the use of a computer that, for example, has no hard disk.

The software used to implement the present invention may be structured in a
30 variety of ways. In one embodiment, the software architecture includes a

combination of user-mode and kernel mode components, as shown in FIG. 6. For ease of reference, FIG. 7 shows these components labeled using MICROSOFT WINDOWS specific terms. It is understood, though, that the invention is not limited to a WINDOWS implementation. The kernel mode components include one or more

5   bus drivers 208, 210 and 212. Each bus driver translates commands and data to and from a format that is understandable by a particular type of device. For example, a USB bus driver translates data and commands to and from the USB format to allow communication with USB devices. To aid in describing this architecture, it is assumed that the imaging source device 110 is in communication with the bus driver

10   212. When implemented using the MICROSOFT WINDOWS family of operating systems, the bus drivers 208, 210 and 212 may be a USB bus driver, a SCSI bus driver, and a 1394 bus driver respectively. One or more device drivers 214 communicate with the bus driver modules. Each device driver 214 provides an interface between a bus driver and the rest of the components in the architecture.

15   Accordingly, each device driver 214 represents an imaging source device to the rest of the components.

A still image processing layer 216 communicates with the device drivers 214. The still image processing layer 216 processes still image data received from the device drivers 214 and provides still images to other user-mode components. The still

20   image processing layer also calls programming interfaces of the device drivers 214 to convert still images received from the user components into bus-specific formats. When implemented on the MICROSOFT WINDOWS family of operating systems, the still image processing layer 216 is a set of component object model (COM) objects that make up the various functions or "methods" of the WINDOWS IMAGE

25   ACQUISITION (WIA) COM layer. The WINDOWS IMAGE ACQUISITION architecture provides a mechanism for representing an imaging source device to a computer's operating system and to applications running on the computer. Examples of how the WIA architecture may be implemented are generally described in U.S. Patent Application Serial No. 09/153,432, filed September 14, 1998, which is

30   attached as an Appendix and incorporated herein by reference in its entirety.

Referring to FIG. 6, a file management system 220 communicates with the modules 216 and 218. The file management system 220 manages the storage and retrieval of files on a computer-readable medium, such as a hard disk. The file management system 220 has a user interface (UI) 222 for allowing a user to call

5　functions of the system 220. When implemented on the MICROSOFT WINDOWS family of operating systems, the file management system 220 is WINDOWS EXPLORER file management system (FIG. 7).

The image helper program described previously is depicted by module 221 (FIG. 6). When implemented on the MICROSOFT WINDOWS family of operating

10　systems, the image helper program is the "Scanner and camera wizard" (FIG. 7). In one embodiment of the invention, the image helper program 221 relies on one or more destination plug-ins 223. Each plug-in is a software module that is capable of transferring images to a particular destination. For example, one plug-in may send images to a personal web site, while another might send images to a commercial

15　photo printing service web site. An application programming interface (API) 225 is provided by the image helper program 221 to allow plug-ins to participate in and take over the process of transferring images to destinations.

A procedure that may be followed to transfer an image from an imaging source device communicatively linked to a computer to a destination will now be

20　described. This procedure is assumed to be executed using a 1394-compatible digital camera in conjunction with a computer running one of the MICROSOFT WINDOWS family of operating systems. The procedure starts at step 250 of FIG. 8, at which the scanner and camera wizard 221 (FIG. 7) executes, either in response to detecting the presence of the imaging source device 110, or in response to the user double-clicking

25　an icon representing the imaging device in the EXPLORER UI 222. At step 252, the image helper program 221 determines which plug-ins 223 have registered with the API 225 and are available to use. The wizard 221 then displays the UI of FIG. 2 to the user at step 254. In displaying the UI of FIG. 2, the image helper program obtains the icons and text for each entry of the pull-down menu from each of the respective

30　plug-ins 223. At step 256, the user chooses the destination to which the image taken

from the device 110 is to be sent. In this example, it is assumed that the user has chosen to send an image to an MSN Photo Community. At step 258, the wizard 221 invokes the plug-in 223 associated with the destination "MSN Community." The plug-in 223 then displays the UI of FIG. 3 at step 260 to prompt the user to enter the

5   MSN community to which the image is to be transferred. At step 262, the wizard 221 transfers the image to the hard disk 108 (FIG. 1), and displays a progress indicator (FIG. 4) to the user. Although the invention may be practiced without this step, transferring the image to the hard disk helps insure that a back-up copy is available in case the plug-in 223 modifies the image. As an optional feature of the invention, the

10   user may be able to modify settings of the image helper program 221 so that no copy of the image remains on the hard disk. Once the transfer of the image to the hard disk is complete, the flow proceeds to step 264, at which the plug-in 223 is invoked. The plug-in 223 opens a web browser (FIG. 5) and displays the image on the web community entered by the user at step 260. The transfer process is then complete.

15   It can thus be seen that a new a useful method and system for transferring an image from an imaging source device to a destination has been provided. In view of the many possible embodiments to which the principles of this invention may be applied, it should be recognized that the embodiment described herein with respect to the drawing figures is meant to be illustrative only and should not be taken as limiting

20   the scope of invention. For example, those of skill in the art will recognize that the elements of the illustrated embodiment shown in software may be implemented in hardware and vice versa or that the illustrated embodiment can be modified in arrangement and detail without departing from the spirit of the invention. Therefore, the invention as described herein contemplates all such embodiments as may come

25   within the scope of the following claims and equivalents thereof.